

CURRENT DEVELOPMENTS IN BLISTER RUST CONTROL
INVESTIGATIONS (1960), SPECIAL REPORT--CALIFORNIA

General

Previously reported project activities in blister rust control investigations in California were continued in general through 1960. No field work was done this year on ribes ecology plots nor on tests of new chemicals for ribes eradication.

H. R. Offord accompanied the group inspecting blister rust fungicide tests in northern California in May, and the group inspecting tests in northern California and southern Oregon in June.

Several reports on blister rust and its control have been published in 1960, or are being prepared for publication.

(1) Bega, R. V.--Effect of environment on germination of sporidia in Cronartium ribicola. Phytopathology 50(1):61-69. 1960.

(2) Bega, R. V., and J. R. Parameter--Temperature and humidity effects on viability of teliospores of Cronartium ribicola. (Manuscript.)

(3) Bega, R. V., and H. A. Scott--Electron microscope studies of sporidia of Cronartium ribicola. (Manuscript.)

(4) Kimmey, J. W., and W. W. Wagoner--Spread of white pine blister rust from ribes to sugar pine in California and Oregon. USDA, Technical Bulletin. ~~(In press, Govt. Printing Office)~~ (251: 710 Oct., 1961).

(5) Quick, C. R.--Estimation of blister rust infection intensity on the Eldorado NF by regression analysis of selected habitat factors. (Manuscript.)

(6) Quick, C. R.--Growth and fruiting of Ribes roezli, the Sierra Nevada gooseberry, on a burn in mature timber. (Revised manuscript.)

Disease Studies.

Two one-acre status-of-disease plots were inspected in 1960 for ribes plants and for blister rust infection on sugar pine. Both of the checked plots are on the north end of the Eldorado NF.

The first plot (Middle Meadows No. 1), when established in mature timber in 1949, supported 358 young sugar pines. It now has 296, a loss of 17.3% in 11 years. The same plot, when checked for ribes in 1950, supported 12 ribes plants with a total of 11.5 feet of livestock. In 1960, 7 ribes with 15.0 feet of livestock were found. All 7 bushes

(2) C. R. Quick to H. R. Offord. Forest Disease Research (Status of PSW Station Work on Direct Control of Blister Rust with Fungicides). Office report, 2 pp. text, plus 5 summary tables. File: 4600(5270). October 21, 1960.

(3) See also: Keith Arnold, Director, by H. R. Offord, to Regional Forester, R-5. Forest Disease Research (Control of WPBR). 4600 (5270), October 21, 1960. Two-page memorandum.

Preliminary results of the 1959 tests are presented and discussed in items (2) and (3) above. No thoroughly satisfactory treatment was defined by the 1959 trials.

The Region 5 - Klamath NF seasonal 2-man crew (W. V. Showalter and R. Dolbec) initiated a total of 25 tests (342 trees) north of Oak Knoll Ranger Station in the periods July 1 to 29 and August 23 to 28. These Klamath series included 10 tests (171 trees) with cycloheximide (Acti-dione BR Concentrate, Upjohn), 6 tests (68 trees) with phytoactin (Phyto-Pabst A, Pabst), 5 tests (61 trees) with pentachloro-nitrobenzene (Terraclor, Olin Mathieson), and 2 tests (21 trees) with o-phenylphenol (Dowicide 1, Dow). All late-season tests with cycloheximide on the Klamath included Acti-dione Oil Soluble Emulsifier D (Formulation #186). This "Additive D" in prescribed amounts is supposed to make any light petroleum oil a satisfactory spray carrier for Acti-dione BR Concentrate. A hand axe was used to make multiple slits through the bark of a fourth to a half of the trees in each test on the Klamath. The bark slits were all parallel to the axes of the treated trees.

The PSW Station crew (C. R. Quick and Ed. M. Connolly) put out 32 tests (354 trees) on the west slope of Hatchet Mtn. during the period August 11-18, 1960, on lands of the Scott Lumber Co. of Burney. These trials included 12 tests (121 trees) with phytoactin, 7 tests (78 trees) with cycloheximide, 2 tests (24 trees) with pentachloronitrobenzene, 2 tests (22 trees) with benzoic acid, 2 tests (21 trees) with Omadine (Olin Mathieson) and 1 test (9 trees) with o-phenylphenol. The 5 tests (68 trees) with Acti-dione BR Concentrate all contained the additive Acti-dione Oil Soluble Emulsifier D (Formulation #186, Upjohn).

In 1960, the tendency to use higher concentrations of applied fungicides, the common substitution of stove oil for kerosene as spray carrier, the use of axe slits on many trees in the Klamath trials, the application of phytoactin in oil carriers as trunk spray instead of overall dilute aqueous spray, and the addition of "Additive D" to most batches of Acti-dione BR should define an effective treatment, or will make the problem appear unlikely of early solution.

Both the 1959 tests (61 tests, 622 trees) and the 1960 tests (57 tests, 696 trees) should be checked in detail next summer.

Rust Resistant Sugar Pine.

Operational portions of the rust-resistant sugar pine project in general have now been transferred to Carl W. Fowler, Placerville Forest Nursery, Eldorado NF, and to the Region 5-Klamath NF seasonal crew, which

(2) C. R. Quick to H. R. Offord. Forest Disease Research (Status of FSW Station Work on Direct Control of Blister Rust with Fungicides). Office report, 2 pp. text, plus 5 summary tables. File: 4600(5270): October 21, 1960.

(3) See also: Keith Arnold, Director, by H. R. Offord, to Regional Forester, R-5. Forest Disease Research (Control of WPBR). 4600 (5270), October 21, 1960. Two-page memorandum.

Preliminary results of the 1959 tests are presented and discussed in items (2) and (3) above. No thoroughly satisfactory treatment was defined by the 1959 trials.

The Region 5 - Klamath NF seasonal 2-man crew (W. V. Showalter and R. Dolbec) initiated a total of 25 tests (342 trees) north of Oak Knoll Ranger Station in the periods July 1 to 29 and August 23 to 28. These Klamath series included 10 tests (171 trees) with cycloheximide (Acti-dione BR Concentrate, Upjohn), 6 tests (68 trees) with phytoactin (Phyto-Pabst A, Pabst), 5 tests (61 trees) with pentachloro-nitrobenzene (Terraclor, Olin Mathieson), and 2 tests (21 trees) with o-phenylphenol (Dowicide 1, Dow). All late-season tests with cycloheximide on the Klamath included Acti-dione Oil Soluble Emulsifier D (Formulation #186). This "Additive D" in prescribed amounts is supposed to make any light petroleum oil a satisfactory spray carrier for Acti-dione BR Concentrate. A hand axe was used to make multiple slits through the bark of a fourth to a half of the trees in each test on the Klamath. The bark slits were all parallel to the axes of the treated trees.

The FSW Station crew (C. R. Quick and Ed. M. Connolly) put out 32 tests (354 trees) on the west slope of Hatchet Mtn. during the period August 11-18, 1960, on lands of the Scott Lumber Co. of Burney. These trials included 12 tests (121 trees) with phytoactin, 7 tests (78 trees) with cycloheximide, 2 tests (24 trees) with pentachloronitrobenzene, 2 tests (22 trees) with benzoic acid, 2 tests (21 trees) with Omadine (Olin Mathieson) and 1 test (9 trees) with o-phenylphenol. The 5 tests (68 trees) with Acti-dione BR Concentrate all contained the additive Acti-dione Oil Soluble Emulsifier D (Formulation #186, Upjohn).

In 1960, the tendency to use higher concentrations of applied fungicides, the common substitution of stove oil for kerosene as spray carrier, the use of axe slits on many trees in the Klamath trials, the application of phytoactin in oil carriers as trunk spray instead of overall dilute aqueous spray, and the addition of "Additive D" to most batches of Acti-dione BR should define an effective treatment, or will make the problem appear unlikely of early solution.

Both the 1959 tests (61 tests, 622 trees) and the 1960 tests (57 tests, 696 trees) should be checked in detail next summer.

Rust Resistant Sugar Pine.

Operational portions of the rust-resistant sugar pine project in general have now been transferred to Carl W. Fowler, Placerville Forest Nursery, Eldorado NF, and to the Region 5-Klamath NF seasonal crew, which

divides its time between the RR-SF project and the project on control with fungicidal control of blister rust on sugar pine in the Region.

In September, Quick accompanied Fowler on the annual fall cone-collecting and candidate check-out trip to the Klamath. In early November, two days were spent training nursery personnel to graft sugar pine and assisting in the grafting of rust-resistant scionwood onto potted planting stock at the Placerville Nursery. The scionwood was entirely from candidate trees in the Elbow Spring area or from Thompson Ridge, northeast of Happy Camp, Klamath NF.

Many twig and needle-bundle cuttings were selected from the candidate scionwood material left over from the grafting at the Placerville Nursery. These were taken to Berkeley and incorporated into experimental cuttings cultures. One set of the new cutting cultures is in a south window in the office, and another set is in the shade north of a small home garage. An attempt should be made to root sugar pine cuttings under intermittent mist. This may be tried in the spring of 1961. If the mist method of keeping sugar pine cuttings moist for long periods of time is not promising, the rooting of large numbers of cuttings from candidate trees in the immediate future is improbable.

Numerous field grafts were made in early September on sugar pine regeneration growing back of Landing #3, Stanislaus Experimental Forest. Scions from some saplings were simply grafted onto other saplings as a test of methods. Several types of grafts were made. None of the grafts were "bottle" grafts, and none were protected by plastic or paper bags, or were artificially shaded. Subsequent weather was warm, clear, and dry, and it is doubtful if many of the grafts will survive. Grafts made in October or early November should have a better chance of survival. Early spring grafts also should be attempted.

C. R. Quick
Berkeley, California
November 28, 1960